

the small conducting power of the wire, as well as the weak current from the atmosphere.

Another inference may be drawn from these observations. If we take the average of the results on December 31 on Pietarintunturi, when the whole apparatus was used, it will be 3.2 parts of the metre, and comparing this with that of December 19 on Oratunturi, when the atmospheric conditions were similar, which was 3.6 parts of the metre, and transform these into minutes, the result will be as follows: 3.6 parts of the metre at 2.2 = 7.92; 3.2 parts of the metre at 1.2 = 3.84, but the sensitiveness of the galvanometer at Pietarintunturi was only 0.36 of that at Oratunturi = 0.37, and the area of the apparatus in the former 200 square metres against 900 in the latter, and further, assuming that the current increases in proportion to the area of the apparatus, we shall have:

$$\frac{3.84}{0.36} \frac{900}{400} = 24'.0.$$

And the deflexion 3.84 being reduced to the same galvanometer sensitiveness and the same area of apparatus, the actual result is that the experiments at Oratunturi showed a deflexion *three times* greater than those at Pietarintunturi. The latter place is certainly situated a little higher than the former, but in my opinion the increase of the electric force lies in the fact that Oratunturi is in a higher latitude than Pietarintunturi, *i.e.* nearer the plane of the aurora borealis. Although the experiments recorded above suffer from inaccuracy on account of the imperfect insulation, I have come to the conclusion *that the electric current from the atmosphere increases rapidly with the latitude.*

The great deflexion which I obtained at Oratunturi on December 13, 1882, I do not consider refutes this inference, as the atmospheric conditions on this occasion were exceptional, *viz.* the temperature high and the air hazy.

The experiments in both places have, however, unfortunately been of a somewhat provisional character, which is due to the external impediments in our way. Thus, when experimenting at Oratunturi, the writer had to make a journey in the snow of 20 kilometres, *viz.* of four hours' duration, then to examine the apparatus on the summit, clean it from hoar-frost, and often repair it, with the thermometer at  $-30^{\circ}\text{C}$ . Then only could the experiments be commenced. It was only possible to work for five to eight minutes at a time, as it was necessary to thaw one's benumbed hands before a bonfire lit on the snow. At Pietarintunturi the road was certainly shorter, but, nevertheless, very fatiguing, as it was necessary first to climb a ridge about 1000 feet, and then journey about 3 kilometres.

These difficulties, and chiefly the imperfect insulations and the weakness of the wires at my disposal, compelled me to abandon experiments of this character.

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(To be continued)

### NOTES

BESIDES Prof. Huxley the following English men of science have been elected Foreign Associates of the U.S. National Academy of Sciences:—Prof. J. C. Adams, Prof. Cayley, Prof. Sylvester, Prof. Stokes, Sir William Thomson, and Sir J. D. Hooker.

MR. HERBERT SPENCER has been elected a Corresponding Member of the Paris Academy of Moral and Political Sciences.

THE remarkable enthusiasm with which the project of the memorial to Charles Darwin was received in Sweden has already been noticed in our columns. The amount of the subscriptions collected, as was said, from all ranks, has just been received by

the treasurer of the Darwin Memorial Fund. It is a sum of 382*l.* 12*s.* 6*d.*, the largest, we believe, that has been contributed by any foreign country, and a proof of the zeal on behalf of science that exists in the land of Linnaeus.

WE are glad to learn that America has at length subscribed for a table at the Zoological Station at Naples. In view of the very considerable number of American students in European biological laboratories some surprise has naturally been felt that America has not hitherto been represented at Naples. President Carter and the trustees of Williams College are to be congratulated on having taken the lead in a matter the importance of which must be apparent to all who are interested in the progress of morphological study.

DR. WILLIAM CHAMBERS, the head of the eminent publishing firm, well deserves the honour of a baronetcy which he has just received, on account of the public services rendered by him to education and to social improvement throughout a long life; he is just the age of the century, we believe.

The public sale of the late Prof. J. Decaisne's library will take place in Paris from June 4 to 23 next. The catalogue of 480 pages, published by Labitte, of Paris, contains more than 5000 entries, classified according to subject by M. Vesque, assistant to the late M. Decaisne. It is probably one of the finest libraries in botany, horticulture, and general natural history which has been sold since the death of Jussieu. The catalogue contains a portrait of Decaisne and a biography by Dr. E. Bornet.

THE death is announced, at the age of seventy-one years, of Mr. James Young of Kellie, the "Sir Paraffin" of his old friend Livingstone. Mr. Young is best known in connection with his process of distillation of paraffin oil from bituminous coal, which attained great dimensions, and from which he realised a fortune. Mr. Young took a real and active interest in chemical research, and founded the Chair of Economic Chemistry in Anderson's University, Glasgow; he was a Fellow of the Royal Society.

THE departure of the Swedish Expedition to Greenland has been postponed to the 22nd, and Baron Nordenskjöld will join the *Sofa* at Gothenburg, instead of coming to Scotland.

A HYGIENIC exhibition was opened at Berlin on Saturday.

THE Society of Arts *conversazione* will this year be held in the buildings of the International Fisheries Exhibition; the Prince of Wales, the President of the Society, has intimated his intention of being present. The date is not yet announced.

IN connection with the recent discussion on the opening of picture galleries and museums on Sundays, the following facts relating to the Whitechapel Fine Art Exhibition are full of interest. This exhibition, which as may not be known to all our readers, is one which is open for thirteen days at Easter in one of the most desolate parts of this great metropolis. It consists of about two hundred pictures of the highest order of merit, which are placed at the disposal of a responsible committee by the artists or those who are fortunate enough to possess them. It is open gratuitously from ten in the morning until ten at night, except on Sundays, when the opening takes place at two o'clock, after morning service. This year, it will be seen from the numbers we give below, that no less than 34,644 of the poorest of the poor visited the pictures; and as they were to a very large extent "personally conducted" round the rooms by ladies and gentlemen who freely gave up their time to the work, the way in which they appreciated the pictures is thoroughly well known. The same men and women came again and again, bringing their friends to show them the pictures in which they themselves had taken the greatest interest. One of the most important points that we wish to urge now is, that on the last day the exhibition was open, which

was Sunday, between the hours of two and ten more than 3000 working men and women visited the collection, and we are informed that when the rooms were most crowded, there was always not only absolute order and good temper, but a reverence for the spirit of the place. This, we think, is a sufficient reply to those who say that if picture galleries and museums were opened on Sunday, they would not be visited. Seeing that a love of science and nature must be at the bottom of all true love for art, we feel ourselves bound to thank Mr. Barnett and those who have helped him in this humanising work; and as it is known with what sympathy artists and possessors of pictures placed them at the disposal of the committee, we think it a pity that the Whitechapel example is not more generally followed. It is not necessary to give the numbers for 1882, but we may just say that very nearly 10,000 more people visited the exhibition this year, which clearly shows that the interest taken in it is not a transient one, but one which increases from year to year. And the figures do not do justice to the success of the exhibition, for they mean something more than they would at an exhibition in the West End; the Whitechapel people went to see, and they made a business of seeing. The attendances were as follows:—

Tuesday ... ..	March 20 ... ..	933
Wednesday ... ..	" 21 ... ..	2,094
Thursday ... ..	" 22 ... ..	1,431
Good Friday ... ..	" 23 ... ..	2,722
Saturday ... ..	" 24 ... ..	2,581
Easter Sunday ... ..	" 25 ... ..	1,632
" Monday ... ..	" 26 ... ..	3,369
" Tuesday ... ..	" 27 ... ..	3,304
Wednesday ... ..	" 28 ... ..	3,523
Thursday ... ..	" 29 ... ..	3,212
Friday ... ..	" 30 ... ..	2,681
Saturday ... ..	" 31 ... ..	4,045
Sunday ... ..	April 1 ... ..	3,117

Total for 13 days ... 34,644

AT the first meeting of the Sociological Section of the Birmingham Natural History and Microscopical Society for the study of Mr. Herbert Spencer's "System of Philosophy" held last week at the Mason College, the President (Mr. W. R. Hughes) explained that the new Section had originated in a wish to unite, for the purposes of mutual help, those who were already students of Mr. Herbert Spencer's system, but were unknown to each other; and to introduce to the synthetic philosophy those already engaged in some special biological study, but as yet unfamiliar with the principles common to all departments of natural history. He read a letter from Mr. Herbert Spencer expressing cordial sympathy with the objects of the Section, and adding some valuable suggestions as to the course of work to be undertaken by the Section. Whether we admitted or rejected Mr. Spencer's principles, the President said, there was no doubt of the wonderful influence they were exercising in this country, on the Continent, and in America. He enumerated many reasons why Birmingham was peculiarly adapted for the study of sociology, saying it was central, healthy, industrious, and earnest in all it undertook, active in reform, versatile in its trades, and therefore free from commercial panics, many-sided in religion, untiring in political activity. During the present century no town had exhibited a more remarkable social development, and therefore there was no town more fit for the study of sociology. Its development was of a type peculiar to a large industrial organisation, and was in marked contrast to that kind of development which would obtain under a military or ecclesiastical or agricultural organisation. Sociological generalisations made there might therefore be regarded as typical and unique. The President's address was followed by a discussion upon the first two chapters of the "Essay on Education."

MR. CLEMENT L. WRAGGE has undertaken to reorganise the meteorological work at the Ben Nevis Observatory,

which he first commenced about two years ago, under the auspices of the Scottish Meteorological Society, and hopes to have the observing system reopened and in order by June 1. Mr. William Whyte, of Fort William (formerly assistant), will then receive further instruction from Mr. Wragge, and will take charge, having been appointed by the Society to carry on the work during the summer of the present year, in consequence of Mr. Wragge's intention to resume his travels in the course of a few months, and to revisit Australia. The voyage will be made a scientific one, and Mr. Wragge hopes to add largely to his natural history and ethnographical collections now at Stafford. He is arranging to carry on ocean meteorological observations on a large scale, following mainly the plan adopted by the *Challenger* expedition. Negretti and Zambra's new deep-sea thermometers are to be employed.

THE German gunboat *Hyäne* visited Easter Island last autumn, and determined its exact position, which was found to be 27° 10' S. lat., and 109° 26' W. long. The commander of the *Hyäne*, Capt. Geiseler, has reported minutely to the German Admiralty Office on the ethnology of the island, and this report is accompanied by numerous drawings of old colossal statues, stone houses, monuments, tombs of chiefs, &c. At the same time Capt. Geiseler made a collection of ethnological specimens which has been forwarded to Germany by way of Apia. The report is now printed and published by Mittler and Sohn (Berlin).

PROF. BASTIAN has been nominated honorary president of the Berlin Geographical Society. The following gentlemen have been elected as honorary members: Prof. von Richthofen, Dr. Gustav Nachtigal, Prof. Neumayer, Dr. Pogge, Dr. Buchner, and Lieut. Wissmann. The latter has also received the Society's Silver Knights-Medal.

AT Berlin an aurora borealis was observed on April 29 at 9 p.m. The phenomenon brightened up the whole sky, across which numerous bright red cloud-streaks seemed to shoot.

MR. ERNEST GILES, the explorer, contemplates organising a grand final expedition to traverse the remaining unexplored portions of the Australian continent, and to endeavour to discover some more trustworthy traces of Leichhardt.

IN the "Publications of the Massachusetts Society for the Promotion of Agriculture," Mr. S. H. Scudder has given an interesting account of the habits of a small moth (*Retinia frustrana*), and of the ravages caused by it on the pitch pine of Nantucket Island (*Pinus rigida*). Of late it has become so abundant as to threaten the total destruction of the pines. Like its European congeners its larvæ bore into the interior of the healthy young shoots and destroy them. The remedy recommended is the radical one of taking off from every tree those shoots that show themselves to be infested, but the author is fully alive to the difficulties attendant upon such a recommendation, especially those of expense. The insect has not yet made its appearance on the adjoining mainland, but it seems to have been observed in other more distant parts of the Eastern States. In Europe (and indeed in Britain) much damage is done to conifers (especially Scotch fir) by allied species, and they more especially infest quite young trees. Some of them principally affect the lateral shoots, and these, if not too numerous, cause no lasting injury to healthy young trees; but one especially (*R. turionella*) attacks the leading shoot, and is far more serious; in this case, if the tree be strong and healthy, a lateral shoot takes the place of the destroyed "leader," and recovery is effected by this means.

News has at last been received from Dr. Pogge, the companion of Lieut. Wissmann, on his journey across Africa, and who remained in Africa after Wissmann left. It appears that

Dr. Pogge reached the Mukenge safely in September last, bringing large collections with him. He had written and sent to Malange for means for his return journey.

A REPORT on the Peter Redpath Museum, Montreal, the foundation of which was laid by the Marquis of Lorne in September, 1880, describes the opening ceremony in August, during the meeting of the American Association. Mr. Redpath in a very few words handed over the Museum to the University, and speeches were made by the Chancellor, Dr. Carpenter, Prof. Hall, and Dr. Dawson. Already collections have been placed in the Museum, which promises to become one of the first rank.

THE current number of the *Agricultural Students' Gazette*, edited by students at the Royal Agricultural College, Cirencester, contains an instructive article on Devonshire Orchards and Cider-making, by C. B. Northcote, a member of the College. Miss Ormerod contributes a paper on the Coffee Grub in Ceylon, embodying our information on this pest up to the present time, from information largely derived from a pamphlet by Mr. Haldane on the subject. Mr. Rutherford gives a concise paper on the Agriculture of the Cotswolds; Prof. Garside one on Glanders, adducing evidence that it is a germ disease due to a bacillus. There is also an interesting and instructive collection of chemical curiosities, answers to examination questions; and in addition reports on the experimental field plots, on the weather, on the amount of chlorine in the rain water of the district, and on many other more purely college matters. This magazine fully keeps up to its advanced standard, and has a value in a circle far wider than its immediate connection with the Agricultural College.

WE have received the *Proceedings of the Medical Society of the Kazan University*, which contains, besides purely medical papers, several valuable papers of general interest. We notice among them a lecture, by Prof. Scherbakoff, on carbonic and azulmic acids in the soil as a measure of the oxidation of its organic constituents. It is known that since more attention has been given to the sanitary conditions of different soils, Herr Peitenkofer has proposed to measure the amount of putrefied organic matter in the soil by the amount of carbonic acid it contains. Prof. Scherbakoff makes a complete analysis of the chemical and putrefactive processes that are going on in the soil, and comes to the conclusion that, unhappily, the carbonic acid does not give a measure either of the oxidating capacity of the soil or of the decomposition of the organic matter. The same conclusion is arrived at with regard to azulmic acid, which is formed only under the action of special ferments, as appears from the classical researches of MM. Schlesing, Müntz, and Pasteur, so that oxidation of the organic elements of the soil may go on on a large scale without azulmic acid appearing as a result of the process. We notice also a paper, by M. Orloff, on the influence of wet and dry chlorine upon different materials when used for disinfection, the author giving the results of a series of experiments on various linen, cotton, silk, and woollen stuffs. The tables of diseases at Kazan and in several districts of the province are also of great interest; they show, for instance, that the number of cases of malarial fever is really enormous, as it has reached, in the town of Kazan, the figure of 23,000 cases during five years. As to cattle and horse diseases, their number is still more striking, as every year the province loses no less than 4300 to 4600 head of horned cattle, to which must be added sometimes—as in 1877—3250 cattle and horses exterminated by the Siberian plague.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus radiatus*) from India, presented by Mr. F. J. Wicks; a Ring-tailed Coati (*Nasua rufa*), a Kinkajou (*Cerculeptes caudivolvulus*) from Demerara, presented by Mr. Ernest Francis; a Herring Gull

(*Larus argentatus*), British, presented by Mrs. Andrews; a Smooth Snake (*Coronella levis*), European, presented by Mr. W. A. B. Pain; a Bateleur Eagle (*Helotarsus caudatus*) from Africa, two Germain's Peacock Pheasants (*Polyplectron germaini*) from Cochin China, purchased; a Bennett's Wallaby (*Halmaturus bennetti*), four Brown-tailed Gerbills (*Gerbillus erythrurus*), born in the Gardens.

### OUR ASTRONOMICAL COLUMN

D'ARREST'S COMET.—The following approximate positions of this comet are deduced from M. Leveau's elements:—

		At Greenwich Midnight				
		R.A.			Decl.	Log. Distance from Earth.
		h.	m.	s.	°	°
May	25	13	13	47	+13 8'9	0'2983
	27	—	12	51	13 6'9	...
	29	—	12	0	13 4'9	0'3015
	31	—	11	15	13 1'9	0'4267
June	2	—	10	35	12 58'0	0'3051
	4	—	10	1	12 53'2	0'4221
	6	—	9	34	12 47'6	0'3090
	8	—	9	13	12 41'1	0'4175
	10	13	8	57	+12 33'9	0'3132

THE OBSERVATORY OF RIO JANEIRO.—We have received the *Bulletin Astronomique et Météorologique de l'Observatoire Impérial de Rio de Janeiro* for January and February. In the first number are observations of the nucleus of the great comet of 1882 made by M. Lacaille. While stationed at Olinda (Pernambuco) for the observation of the transit of Venus, he remarked on November 16 a small nebulosity 6° south of the nucleus of the great comet: it was circular, and had a slight central condensation. On November 20 he saw it again; its aspect was the same as on the previous day, it had the same right ascension, but its declination was 1° further south. On November 22 and 26 it was observed in the same position as on the 20th. M. Lacaille believes that this small nebulosity was no other than a fragment of the nucleus of the great comet. On returning to Rio, he found on January 8, on examining this nucleus with the 10-inch equatorial and power of 500, that it was highly elongated and subdivided into four small nebulosities, the centres of which had the appearance of stars of the twelfth magnitude. The aspect of the fourth as compared with the others, was less condensed, but rather more lengthened out. On the following night he was surprised to find that the first nebulosity was no longer in the position that he had seen it on the 8th, but that it was situate outside the elongated nucleus, and its centre had lost the appearance of a star of the twelfth magnitude. The second nebulosity was precisely in the position of the day preceding. The fourth had sensibly approached the third. On January 10 the four nebulosities retained the same relative positions. Several days of cloudy weather followed, but on January 15 he found that there was a fifth nebulosity in the elongated nucleus. These changes are well shown in a lithograph accompanying M. Lacaille's observations. In the February number of the *Bulletin* are observations of the same comet, made at Athens by Dr. Julius Schmidt, as detailed in a letter addressed by him to the Emperor of Brazil. It relates chiefly to the nebulosities which were remarked by Dr. Schmidt in the vicinity of the nucleus of the great comet on October 9, 10, and 11, his drawings showing the fantastic forms presented by the nebulosities being lithographed.

THE OBSERVATORY OF MOSCOW.—Volume IX. (livraison i.) of *Annales de l'Observatoire de Moscou*, has been issued. Amongst the contents are a short paper by M. Bredichin on the resisting medium; Researches on the first comet of 1882 (Wells), and observations of the minor planet Victoria, taken in connection with others to be made at the Cape and other southern as well as northern observatories, as part of a plan organised by Dr. Gill, for the determination of a new value of the solar parallax. M. Bredichin compares the observed phenomena of the tail of the first comet of 1882 with the indications of theory.

KIELL ON TYCHO BRAHE'S NOVA 1572.—It has often been stated in our astronomical text-books, that John Kiell, Professor of Astronomy at Oxford, considered that the period of the celebrated star in Cassiopeia in 1572, was "about 150 years," or only half that which had been more generally assigned to it.